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EDITION AND LIEBER'S 5 LETTER



Woodworkers' Vises

GREENLEE Vises, built under the Evans patents, embody all the principles that go to make up one's conception of a perfect vise. Before being placed on the market, they were subjected to the most rigid and searching tests to bring out any possible weakness in either principle of operation or parts. Some of their most important features are as follows:

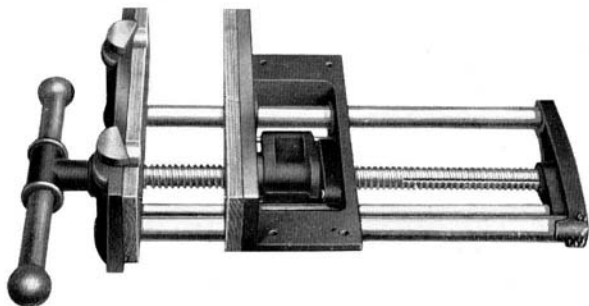
1. Quick action available at any position of the handle.
2. Continuous screw action in both directions.
3. A whole screw unmutilated by grooves.
4. A complete nut fully engaging the screw.
5. Dogs adjustable by the fingers only, and arranged to handle irregular shapes without marring.
6. 100% certain in operation, with premature releasing of the work impossible.



Quick Action is always available in these vises, regardless of the position of the handle. It is not necessary to bring it to any stated position or to turn it backward against the resistance of spring clutches or other mechanism. The screw, by a vertical movement of less than one-half inch disengages the lower half nut, and simultaneously, by means of a lever connection, throws the upper half nut clear. It is an ingenious mechanism, smooth working and simple.

Continuous Screw Action in both directions means that the quick acting feature does not interfere when it is not desirable to use it. It is there when it is wanted, but it doesn't intrude when it is not wanted.

In General Design and workmanship, these vises maintain the sterling qualities of Greenlee products. Attention is called to the all-wood handles which are superior to those with metal ends.



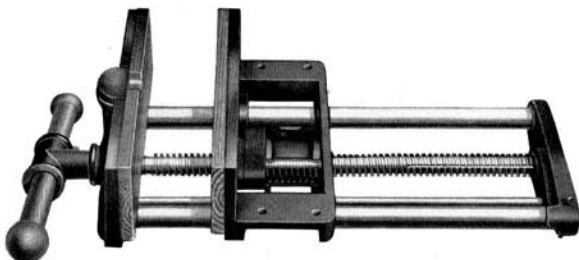
Greenlee Cushion Grip Vise

The Cushion Grip is an absolutely new feature in vise construction and is found only in the Greenlee Vises of this name. In effect it is equivalent to giving the workman a third hand. For about three-quarters of a turn before the power of the screw is exerted, and also following its release, the work is gripped lightly enough to permit it to be adjusted with the hands, yet with sufficient force to keep it from dropping. This is of real practical value, especially where several pieces are worked together.

Greenlee No. 1-B Cushion Grip Vise with twin adjustable dogs in front jaw and one adjustable dog for the bench. Jaws 10 inches long by 4 inches deep above the slides, and will open 12 inches. Both jaws maple lined.



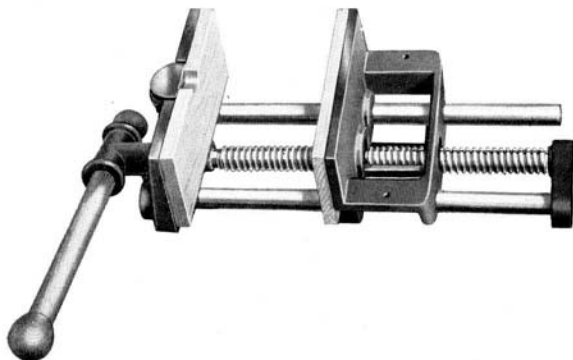
Woodworkers' Vises—Continued



Greenlee Instant Grip Vise

The Instant Grip Vises differ from the Cushion Grip type in that an almost instantaneous gripping or releasing of the jaws takes place through about one-eighth of a turn of the screw. This feature in connection with the quick action of all these vises, provides a speed of operation hitherto unknown.

Greenlee No. 2-A Instant Grip Vise with one adjustable dog in the front jaw and one adjustable dog for the bench. Jaws 10 inches long by 4 inches deep above the slides, and will open 12 inches. Both jaws maple lined.



Greenlee Junior Vise



The Junior Vises are smaller and lower in price than those just described. They have the same features of operation found in the Instant Grip Vises, but the construction is somewhat different. They are recommended particularly for use in the lower grades in manual training work, or where funds are not available to secure the Cushion Grip or Instant Grip types.

Greenlee No. 3-A Junior Vise with one adjustable dog in the front jaw and one adjustable dog for the bench. Jaws 8 inches long by $3\frac{1}{2}$ inches deep above the slides, and will open 10 inches. Both jaws maple lined.

Greenlee No. 3 Junior Vise as above, but without dogs.



Greenlee Tail Vise

The Tail Vise shown above has the same mechanism as the No. 3-A Junior, but the jaws are arranged to hold work either on the side or above the slides, which fits it for any class of work.

Greenlee No. 4-A Tail Vise with single adjustable dog in the front jaw and one adjustable dog for the bench. Jaws $7\frac{1}{2}$ inches long by 4 inches deep with $3\frac{1}{2}$ -inch clearance above the slides and $2\frac{1}{4}$ inches to one side of the slides. Jaws open 10 inches and both are maple lined.

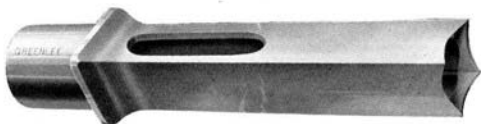
A small booklet with more complete illustrations and description of Greenlee Vises will be sent upon request.



Hollow Chisels and Hollow Chisel Bits

THE manufacture of mortising tools was taken up in connection with our development of Hollow Chisel Mortisers. To obtain the best results with these machines, it is necessary that correct tools be used. The development of these tools has kept pace with the development of our machines and we believe we are correct in our statement that we are the only machine builders who produce both hollow chisels and bits. The illustrations on the following pages represent a few standard tools selected from our line. Our complete catalog of Mortising and Boring Tools will be sent upon request.

We show two types of Hollow Chisels and Bits, the Regular and the Hard-Wear. Hollow chisels up to $\frac{1}{2}$ -inch are furnished in the latter type unless otherwise specified. They have a perfectly smooth bore without broaching and are provided with two openings. The Regular type of chisel has broached corners and is furnished in sizes above $\frac{1}{2}$ -inch. The Hard-Wear type of bit is furnished only when specified. It has a brad point and broad-faced cutting spurs. The Regular type is made with square cutting edges and knife-edged spurs, but without point.



Nos. 104-B and 105-B Regular Hollow Chisels



Nos. 124-B and 125-B Regular Hollow Chisel Bits

The Regular type of Hollow Chisel shown above is made with a blade length of $6\frac{1}{2}$ inches as No. 104-B and with a blade length of 8 inches as No. 105-B. Other lengths are special. Sizes from $\frac{3}{8}$ to $2\frac{1}{2}$ inches square are carried in stock.

Bits for this type of chisel are made with 10-inch twist and 14-inch overall length as No. 124-B, and with 11-inch twist and 15-inch overall as No. 125-B.

**No. 103-B Regular Hollow Chisel****No. 103-H Hard-Wear Hollow Chisel**

The chisels shown above are furnished with 5-inch blades and carried in stock in sizes from $\frac{3}{8}$ to $1\frac{1}{4}$ inches square in the Regular type and from $\frac{3}{8}$ to 1-inch in the Hard-Wear pattern. The $\frac{3}{8}$ -inch chisels are regularly made with re-enforced blades to mortise to a depth of 2 inches, while the larger sizes have straight blades and will mortise to a depth of about 4 inches. On extra hard wood or woods that are difficult to machine, the Hard-Wear type is recommended. Bits used in both types are our No. 122-B or No. 122-H shown below.

**No. 122-B Regular Hollow Chisel Bit****No. 122-H Hard-Wear Hollow Chisel Bit**

The No. 122-B and No. 122-H bits shown above are for use in the 5-inch blade chisels of either the Regular or Hard-Wear types. They have 7-inch twist and are 10 inches overall.

Ask for our complete catalog of Mortising and Boring Tools



Hollow Chisels and Bits—Continued



Nos. 101-B and 102-B Regular Hollow Chisels



Nos. 101-H and 102-H Hard-Wear Hollow Chisels

The No. 101-B Hollow Chisels have 4-inch blades and are carried in stock in sizes from $\frac{1}{4}$ to $\frac{7}{8}$ -inch. The $\frac{1}{4}$ and $\frac{5}{16}$ -inch have re-enforced blades to mortise 2 inches deep, while the other sizes have straight blades and will mortise to a depth of about 3 inches. The No. 102-B Hollow Chisels have $2\frac{3}{4}$ -inch straight blades and are carried in stock in sizes from $\frac{1}{4}$ to $\frac{3}{8}$ -inch.

The No. 101-H and No. 102-H chisels correspond to the Regular types mentioned above, but are without the broached corners. They also have double openings for rapid chip clearance.



Nos. 120-B and 121-B Regular Hollow Chisel Bits



Nos. 120-H and 121-H Hard-Wear Hollow Chisel Bits

The No. 120-B and No. 120-H Bits are for use in our 4-inch blade chisels. They have 6-inch twist and are furnished with an overall length of 9 inches.

The No. 121-B and No. 121-H Bits are for use in the $2\frac{3}{4}$ -inch blade chisels. They have $4\frac{1}{2}$ -inch twist and an overall length of 8 inches.

Ask for our complete catalog of Mortising and Boring Tools



Machine Bits

THIS catalog illustrates and describes a very complete line of single spindle and gang machines for wood boring. The manufacture of boring tools was taken up in connection with the development of these machines, and we now produce a complete and superior line of bits for all classes of work. They are made from the toughest steel obtainable for the purpose, are finished by workmen of long experience and are properly proportioned for strength, fast work and long life.

The following illustrations represent only a few of our standard bits for machine use. We make many other patterns and with various types of heads to suit the class of work to be handled. *Our complete catalog of Mortising and Boring Tools will be sent upon request.*



No. 150 Double Spur Machine Bit

This No. 150 Double Spur is the general purpose machine bit and our principal stock is carried in this pattern. The bit is suited for very rapid work in all kinds of wood and requires a minimum amount of power. It will bore smoothly enough for any purpose except possibly the most exacting requirement such as some kinds of cabinet work.

We illustrate this bit with single screw point as more commonly required. We can make special with any practical pitch, single or double screw, or with brad point.



No. 151 Extension Lip Machine Bit

The No. 151 Extension Lip Machine Bit is preferred by many who desire to do particularly careful boring as in furniture and cabinet work. This bit will do smoother work than any other type or pattern now in use.

Ask for our complete catalog of Mortising and Boring Tools



Machine Bits—Continued



No. 155 Solid Center Machine Bit

The Solid Center type of Machine Bit is offered where there is a demand for a boring tool having greater stiffness than that of the double twist type. It is practical for work requiring great strength, and it combines rigidity with good clearance, free cutting and long life.

While the Solid Center Bit is best known in the pattern shown above, we also supply this type of tool with any of the various head patterns commonly used.



No. 157 Ship Auger Machine Bit

This pattern of bit with single spiral and cutter is a stiff, strong tool suited for boring to extreme depths. It is very commonly used in car, bridge, dock and ship work, particularly in portable boring machines. This type of bit is also furnished without a point as No. 158. It is used for deep boring and will not lead off with the grain of the wood to the extent of bits with point.



Nos. 163 and 164 Screw Shank Dowel Bits

All stock Screw Shank Dowel Bits are 4½ inches long overall and are of the Extension Lip pattern. Other patterns can be made to order. The No. 163 has a 5/16-inch, 20 thread shank and the No. 164 a 7/16-inch, 14 thread shank.

Ask for our complete catalog of Mortising and Boring Tools



No. 180 Countersink Machine Bit

Countersink Machine Bits are very economical wherever concentric holes of varying diameters are required. Their use in such cases avoids at least one handling of stock, and usually permits of better work being done.

The No. 180 Countersink Machine Bit shown above has both cuts of the double spur pattern, and is the one most commonly specified. Our No. 181 is similar except that the larger diameter cuts a bevel to correspond to a screw head. Our No. 182 has larger cut similar to the No. 181 but with the lead of the taper head drill type.



No. 188 Split Shank Countersink

The No. 188 Countersink has a split shank $\frac{1}{2} \times 1\frac{1}{2}$ -inch and overall length of 4-inch. This will make a flat bottom hole as required for the setting of bolt heads, washers, etc. The drill for use in this countersink is our No. 175 Straight Shank pattern having a $2\frac{1}{2}$ -inch long twist, $3\frac{1}{2}$ -inch shank and overall length of 6 inches.



No. 188½ Split Shank Countersink

Our No. 188½ Countersinks are made with overall length of 3 inches and have $\frac{1}{2} \times 1\frac{1}{2}$ -inch split shank. The cutting parts produce a bevel hole corresponding to the taper on the head of a wood screw. The inside drill, our No. 175½ Straight Shank pattern, is regularly furnished with a 2-inch long twist, $2\frac{1}{2}$ -inch shank and overall length of $4\frac{1}{2}$ inches.

Ask for our complete catalog of Mortising and Boring Tools



Machine Bits—Continued



No. 176 Taper Head Drill

The Twist Drill is a satisfactory wood boring tool where the holes are of moderate size or depth. The ordinary metal drill is not efficient for boring wood and the tool we offer is designed for this purpose to allow free cutting and more chip clearance. Our drills are backed off on the edge of twist to prevent friction, but are left with a small portion full size so that the diameter will be maintained as the drill is shortened in resharpening.



No. 177 Spur Machine Drill

The Spur Machine Drill is offered as a tool having the durable, economical features of other drills, but fitted with spurs and point so that it will more nearly approach the smooth boring qualities of a bit. If care is used in sharpening, the brad point and spurs may be maintained and the drill will continue to give service until worn too short for required range.



Nos. 141 and 142 Routing Bits

The Routing Attachment on our Relisher and Mortiser requires a bit as shown. This tool is $3\frac{1}{2}$ inches overall, both shank and flute measuring $1\frac{1}{4}$ inches. In ordering, routing bits should be specified as No. 141 to run left hand, or No. 142 to run right hand. We can supply these either with rounded end as illustrated, or with a cutting end square across.

Ask for our complete catalog of Mortising and Boring Tools



No. 160 Fellow Boring Bit

The name denotes the purpose of these bits. They are carried in stock in sizes from $\frac{3}{8}$ -inch to $\frac{3}{4}$ -inch, all stock tools having 2-inch twist and $\frac{1}{2}$ x3-inch shank.



Nos. 161 and 162 Relishing Bits

The No. 161 Relishing Bit is standard for all older Greenlee Sash Relishing Machines. These are made with the shank straight $\frac{3}{8}$ -inch diameter for one-half of its length and tapering to the diameter of the twist for the remaining half.

The present Greenlee Relishing Machine takes bit with $\frac{1}{2}$ -inch shank, known as the No. 162 Relishing Bit. Like the older bit, this is made with Extension Lips and both measure about $5\frac{1}{4}$ inches long overall.

Bits and Chisels for Hand Use

IN the preceding pages on Mortising and Boring Tools, we have attempted to show only some of our standard patterns. Many others are included in our tool catalog and we also undertake the making of special tools for any ordinary requirements.

After developing a complete line of Machine Boring Bits, we undertook the manufacture of hand boring tools. We now offer a most complete and superior line of Auger Bits and Augers in all types and for all classes of work. We also manufacture a full line of Carpenters' Chisels, Gouges, Turning Tools and Draw Knives.

Since these hand tools bear no particular relation to our line of Woodworking Machinery, we are not including any of them in this catalog. We shall be glad, however, to send our catalog on such tools to those interested.